COMPENSATION TECHNIQUE TO MITIGATE AGING EFFECTS IN INTEGRATED CIRCUIT COMPONENTS

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ABSTRACT

[058] A method and apparatus for compensating for age related degradation in the performance of integrated circuits. In one embodiment, the phase-locked loop (PLL) charge pump is provided with multiple legs that can be selectively enabled or disabled to compensate for the effects of aging. In an alternate embodiment, the power supply voltage control codes can be increased or decreased to compensate for aging effects. In another embodiment, a ring oscillator is used to approximate the effects of NBTI. In this embodiment, the frequency domain is converted to time domain using digital counters and programmable power supply control words are used to change the operating parameters of the power supply to compensate for aging effects.